

LEAK PROOF BAG

MATERIALS

- Zipper-locked plastic bag
- Sharpened pencils
- Access to a sink/faucet

DIRECTIONS

- 1.** Fill the zipper-locked bag halfway with water and then seal it.
- 2.** Hold the pencil in one hand and the bag in the other. Push the pencil in one side of the bag and half way out through the other side.
- 3.** Make sure to try this over the sink or outside so you don't make a mess!

STEM ACTIVITY CARDS



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ACTIVITY FOUND AT:
[http://www.stevesplanglerscience.com/
lab/experiments/leak-proof-bag/](http://www.stevesplanglerscience.com/lab/experiments/leak-proof-bag/)

WHY?

The zipper-locked plastic bag you used was most likely made out of a polymer called low-density polyethylene (LDPE). It's one of the most widely used packaging materials in the world. LDPE is low in cost, lightweight, durable, a barrier to moisture, and very flexible.

Think of the LDPE molecules as long strands of freshly cooked spaghetti. The tip of the sharpened pencil can easily slip between and push apart the flexible strands of spaghetti, but the strands' flexible property helps to form a temporary seal against the edge of the pencil. When the pencil is removed, the hole in the plastic bag remains because the LDPE molecules were pushed aside permanently and the water leaks out.

As you may have discovered, it's much easier for the stretched plastic to seal around the smooth sides of a round pencil than the straight edges found on other pencils. Hopefully you discovered this tip during practice and not while the bag was precariously positioned over someone's head.

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SCIENCE TERMS FOR FURTHER DISCUSSION:

- **Polymer**
- **Hydrophobic**
- **Barrier**